

Appl. No. 10/092,669
Amdt. dated 11/9/05
Reply to Office Action of 8/25/05

PATENT
Docket: 010481

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently amended) A method of calibrating an oscillator comprising:
generating a first signal indicative of ~~an initial~~ a frequency of the oscillator ~~for an input parameter~~;
generating a second signal indicative of a reference frequency, wherein the generating the first and second signals comprises scaling the ~~initial~~ frequency of the oscillator and scaling the reference frequency at approximately the same time so that the ~~generated~~ first and second signals are substantially in phase for calibration of the oscillator; and
adjusting the ~~initial~~ frequency of the oscillator based on a comparison of the first and second signals.
2. (Currently amended) The method of claim 1, wherein the oscillator comprises a voltage controlled oscillator ~~and the input parameter comprises a calibration voltage input~~, and wherein the generating the first signal comprises
applying ~~the a~~ a calibration voltage ~~input~~ to the voltage controlled oscillator ~~to generate the initial frequency of the oscillator~~, and
scaling the ~~initial~~ frequency of the oscillator.
3. (Currently amended) The method of claim 1-2, further comprising:
generating ~~the a~~ a calibration voltage ~~input~~ based on temperature; and
applying the calibration voltage to the oscillator for calibration of the oscillator.
4. (Currently amended) The method of claim 1, further comprising:
enabling a phase locked loop after adjusting the ~~initial~~ frequency of the oscillator; and
testing a voltage control input to the oscillator from the phase locked loop to determine whether calibration should be performed again.

Appl. No. 10/092,669
Amdt. dated 11/9/05
Reply to Office Action of 8/25/05

PATENT
Docket: 010481

5. (Currently amended) The method of claim 1, wherein the generating the second signal comprises
receiving the reference frequency from a temperature compensated crystal oscillator, and
scaling the reference frequency.

6. (Currently amended) The method of claim 1, wherein the scaling the ~~initial~~ frequency of the oscillator and the scaling the reference frequency at approximately the same time comprises
initializing divider circuits for the ~~initial~~ frequency of the oscillator and the reference frequency at approximately the same time.

7. (Currently amended) The method of claim 1, wherein the oscillator comprises a voltage controlled oscillator including a number of switched capacitors, and wherein the adjusting the ~~initial~~ frequency of the oscillator based on a the comparison of the first and second signals comprises activating a subset of the switched capacitors based on the comparison of the first and second signals.

8. (Currently amended) The method of claim 1, further comprising:
enabling a phase locked ~~lock~~-loop following calibration of the oscillator, and
adjusting an ~~initial~~ gain of a charge pump of the phase locked ~~lock~~-loop based on a calibration setting of the oscillator.

9. (Withdrawn)

10. (Withdrawn)

11. (Withdrawn)

12. (Withdrawn)

13. (Withdrawn)

14. (Withdrawn)

Appl. No. 10/092,669
Amdt. dated 11/9/05
Reply to Office Action of 8/25/05

PATENT
Docket: 010481

15. (Withdrawn)
16. (Withdrawn)
17. (Currently amended) An apparatus comprising:
circuitry that generates a first signal indicative of ~~an initial~~ a frequency of an oscillator ~~for an input parameter;~~
circuitry that generates a second signal indicative of a reference frequency, wherein the circuitry that generates the first and second signals scales the ~~initial~~ frequency of the oscillator and scales the reference frequency at approximately the same time so that the ~~generated first and second~~ signals are substantially in phase for calibration of the oscillator; and
circuitry that adjusts the ~~initial~~ frequency of the oscillator based on a comparison of the first and second signals.
18. (Currently amended) The apparatus of claim 17, wherein the oscillator comprises a voltage controlled oscillator ~~and the input parameter comprises a calibration voltage input, and~~ wherein the circuitry that generates the first signal applies ~~the~~ a calibration voltage input to the voltage controlled oscillator ~~to generate the initial frequency of the oscillator and scales the initial frequency of the oscillator.~~
19. (Currently amended) The apparatus of claim 17, further comprising:
circuitry that generates ~~the~~ a calibration voltage input based on temperature; and
circuitry that applies the calibration voltage to the oscillator for calibration of the oscillator.
20. (Original) The apparatus of claim 17, wherein the circuitry that generates the second signal receives the reference frequency from a temperature compensated crystal oscillator and scales the reference frequency.
21. (Currently amended) The apparatus of claim 17, wherein the circuitry that scales the ~~initial~~ frequency of the oscillator and scales the reference frequency at approximately the

Appl. No. 10/092,669
Amdt. dated 11/9/05
Reply to Office Action of 8/25/05

PATENT
Docket: 010481

same time initializes divider circuits for the ~~initial~~ frequency of the oscillator and the reference frequency at approximately the same time.

22. (Currently amended) The apparatus of claim 17, wherein the oscillator comprises a voltage controlled oscillator including a number of switched capacitors, and wherein the circuitry that adjusts the ~~initial~~ frequency of the oscillator based on ~~a~~ the comparison of the first and second signals activates a subset of the switched capacitors based on the comparison of the first and second signals.

23. (Withdrawn)

24. (Withdrawn)

25. (Withdrawn)

26. (Withdrawn)

27. (Withdrawn)

28. (Withdrawn)

29. (Withdrawn)

30. (Withdrawn)

31. (Withdrawn)

32. (Withdrawn)

33. (Withdrawn)

34. (Currently amended) A method comprising:
selecting a calibration voltage input parameter for an oscillator based on temperature;
applying the calibration voltage to the oscillator; and
calibrating the oscillator based on a frequency of the oscillator ~~at~~ with the calibration voltage applied ~~input parameter~~.

35. (Original) The method of claim 34, further comprising:
controlling the frequency of the oscillator after calibration via a phase locked loop.

Appl. No. 10/092,669
Amdt. dated 11/9/05
Reply to Office Action of 8/25/05

PATENT
Docket: 010481

36. (Currently amended) The method of claim 34, ~~wherein the oscillator is a voltage controlled oscillator, and wherein the selecting the calibration voltage input parameter comprises~~ selecting the a calibration input voltage based on a proportional to absolute temperature (PTAT) voltage.

37. (Currently amended) The method of claim 34, wherein the calibrating the oscillator comprises
calibrating switched circuitry of the oscillator.

38. (Currently amended) An apparatus comprising:
an oscillator including configurable circuitry that defines ~~an initial a~~ frequency of the oscillator ~~at a calibration parameter; and~~
~~temperature compensation circuitry that generates the a calibration voltage parameter~~
based on temperature and used to calibrate the oscillator.

39. (Currently amended) The apparatus of claim 38, further comprising:
a calibration unit that selectively activates the configurable circuitry based on a comparison of a first signal indicative of the frequency of the oscillator and a second signal indicative of a reference frequency.

40. (Currently amended) The apparatus of claim 38, wherein the oscillator is a voltage controlled oscillator ~~and the calibration parameter is an initial input voltage, and wherein the temperature compensation circuitry selects the initial input circuitry generates the calibration voltage based on a proportional to absolute temperature (PTAT) voltage.~~

41. (Currently amended) The apparatus of claim 38, further comprising:
a phase locked loop that adjusts the frequency of the oscillator frequency after calibration via closed-loop analog control of the oscillator.

42. (New) The method of claim 1, further comprising:

Appl. No. 10/092,669
Amdt. dated 11/9/05
Reply to Office Action of 8/25/05

PATENT
Docket: 010481

generating a calibration voltage based on a proportional to absolute temperature (PTAT) voltage; and

applying the calibration voltage to the oscillator for calibration of the oscillator.

43. (New) The method of claim 1, further comprising:
enabling a phase locked loop following calibration of the oscillator; and
initializing divider circuits for the frequency of the oscillator and the reference frequency
at approximately the same time after enabling the phase locked loop.

44. (New) The method of claim 1, further comprising:
enabling a phase locked loop following calibration of the oscillator;
testing a voltage control input provided by the phase locked loop to the oscillator; and
performing calibration of the oscillator again if the voltage control input is outside of a
predetermined range of voltages.

45. (New) The method of claim 34, wherein the selecting the calibration voltage for
the oscillator based on temperature comprises
selecting a lower calibration voltage if ambient temperature is less than normal operating
temperature for the oscillator, and
selecting a higher calibration voltage if the ambient temperature is higher than the normal
operating temperature.